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# Center for Survivability & Lethality (CSL)

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Naval Postgraduate School (U.S.)

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## CSL OBJECTIVES

1. To advance the survivability and lethality disciplines by conducting research and fostering awareness through books, articles, reports, theses, videos, courses, short courses, and presentations.
2. To apply the principles of survivability and lethality developed at NPS for aircraft to other military and civilian platforms, systems, and infrastructure.
3. To expand research opportunities for faculty and students in survivability and lethality by providing a forum to share ideas and interests across different disciplines and platforms.
4. To expand survivability and lethality educational opportunities into many NPS curricula, tracks, courses, and areas of study.
5. To develop a major on-site, off-site, and on-line education program in survivability and lethality for U. S. military and civilian personnel. This includes short courses and presentations at NPS and around the country, and the development of a series of new on-line/internet or distance learning courses, lectures/presentations, and educational videos.
6. To provide a central repository of survivability and lethality library of publications and videos (including books, theses, and reports dedicated to the survivability and lethality disciplines and videos showing various aspects of survivability and lethality).
7. To develop survivability and lethality computer programs that can be used by NPS faculty and students to conduct research and perform studies on platforms, systems, and infrastructure.
8. To work closely with the DoD Test and Evaluation community on survivability and lethality issues, such as the Live Fire Test Law, munitions effectiveness evaluations, and the reduction of personnel casualties in combat.
9. To establish and maintain Cooperative Research and Development Agreements with major U.S. corporations. CRADAs provide an opportunity for NPS faculty to conduct research in survivability and lethality topics of specific interest to corporations and jointly with corporation personnel.

## FOR MORE INFORMATION



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### Senior Technical Advisor

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### Website

[www.nps.edu/CSL](http://www.nps.edu/CSL)



## CENTER FOR SURVIVABILITY & LETHALITY (CSL)





# NAVAL POSTGRADUATE SCHOOL

## CENTER FOR SURVIVABILITY & LETHALITY (CSL)



### THE CENTER

On January 30 2007, the Naval Postgraduate School (NPS) announced the creation of the Center for Survivability & Lethality (CSL). The CSL brings together faculty and students with expertise in a wide range of technical fields, such as survivability, sensors, weapons, radar, infrared and radar signatures, warhead design, ship shock, electronic warfare, weapon engineering, operations analyses, and system engineering, to focus on making U.S. platforms (such as submarines, surface ships, ground vehicles, fixed and rotary wing aircraft, UAVs, and space assets), infrastructure (such as airports, power plants, chemical depots, and transportation centers), and personnel more survivable, as well as making our current and future weapon systems more lethal to the enemy.

- Twenty NPS faculty members from the departments of Physics (PH), Systems Engineering (SE), Mechanical and Astronautical Engineering (MAE) and Electrical Engineering (ECE) participate in the research and education activities of the new center.
- NPS Center on Survivability and Lethality will include an industrial consortium through which industry representatives can support its research efforts, take short courses and receive up-to-date publications in the field.



### CSL VISION

To thwart, withstand, and counter attacks against the United States and its allies by establishing survivability and lethality as an integrated engineering design process throughout all engineering and analysis disciplines.

*"...to significantly expand survivability and lethality engineering as a formalized scientific discipline, and become a conduit for research and education funding focused on developing innovative survivability and lethality applications for industry, government and the military."*

**Robert Ball, PhD, Distinguished Professor Emeritus**  
Naval Postgraduate School

### COURSE OFFERINGS

**ME 4751 (Resident): Combat Survivability** - Survivability, reliability and systems safety engineering for military platforms including submarines, surface ships, fixed-wing and rotary wing aircraft, as well as missiles, unmanned vehicles and satellites.

**ME 4702/4703/4704 (Resident): Missile Track** - Several classes devoted to the understanding of all aspects of missile systems. ([www.nps.edu/mae/missiles](http://www.nps.edu/mae/missiles))

**ME 4700 (Resident & Short Course): Weapon engineering** - Methodologies used in operational products to successfully attack ground targets. ([www.weaponengineering.com](http://www.weaponengineering.com))

**ME 4525 (Resident): Naval Ship Shock Design and Analysis** - Characteristics of underwater explosion phenomena and ship/submarine response to shock loading. ([www.nps.edu/SVCL](http://www.nps.edu/SVCL))

**ME 3750 (DL & Short Course): Aircraft Combat Survivability (ACS)** - Graduate level course for students who work in aircraft survivability fields such as survivability modeling and simulation, ballistic and vulnerability testing, susceptibility reduction and vulnerability reduction. ([www.nps.edu/csl](http://www.nps.edu/csl))

### KEYS TO SUCCESS

The NPS faculty have great expertise, and are world leaders in the analysis, design, and operations for increasing the survivability and lethality of military platforms, weapons, and systems. Additionally, the NPS students are warfighters, and consequently they bring a level of knowledge, experience, and judgment to their research that is not available anywhere else.

The faculty and students, working with the CSL, can also leverage the expertise from other NPS organizations, such as the Center for Homeland Defense and Security, Total Ship Systems Engineering, and the Space Systems Academic Group, in order to produce viable solutions to enhance the security and survivability of any environment.

